

## Problem set 2

**Q1)** A person walked around one half of a circle of radius 5 m. Which of the following statements is correct?

- a) The distance he covered is 10 m.
- b) The magnitude of his displacement is 10 m.
- c) His velocity was constant.
- d) His displacement is zero
- e) Non of the above is correct.

**Q2)** Given that a vector  $\vec{C} = 3\hat{i} + 4\hat{j}$ . When a vector  $\vec{B}$  is added to it the resultant vector is along the positive y direction and has a magnitude equals to that of  $\vec{C}$ . What is the magnitude of vector  $\vec{B}$ ?

- a) 3.2
- b) 6.3
- c) 4.5
- d) 3
- e) 0

**Q3)** The position of a particle moving along the x-axis is given by  $x(t) = 6t^2 - t^3$ , where  $x$  in meters and  $t$  in seconds. What is the position of the particle (in m) when it achieves its maximum speed in the positive  $x$  direction?

- a) 24
- b) 12 m
- c) 32
- d) 16

**Q4)** An object moves in two dimension his equation of motion is given by:

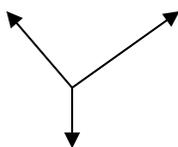
$$\mathbf{R} = (3 - 2t^2) \mathbf{i} - (3t) \mathbf{j}$$

Where  $\mathbf{i}$  and  $\mathbf{j}$  are unit vectors along the x and y axis respectively. The speed of the particle at  $t = 1$  s is:

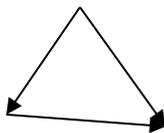
- a) 3
- b) 5
- c) 4
- d) 7

**Q5)** A person walks first at a constant speed of 5 m/s along a straight line from point A to point B and then back along the line from B to A at a constant speed of 3 m/s. What is her average speed over the entire trip? What is her average velocity over the entire trip?

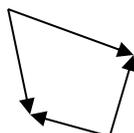
**Q6)** Which of the following diagrams represents forces acting on an object at equilibrium:



a)



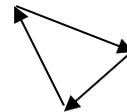
b)



c)



d)



e)